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## STUDIES ON AFRICAN MYRMICINAE, I (HYMENOPTERA, FORMICIDAE)

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This study<sup>2</sup> is based on collections made while I was biologist to the Central African Expedition of the American Museum of Natural History, types being deposited in this museum. Unpublished records from my 1939 African expedition are also included.

Africa, up to a generation ago, was not considered to have a particularly rich fauna of ants belonging to the subfamily Myrmicinae, but many species have since been added. It can now be shown to have a great and highly varied fauna, and the present paper adds to our knowledge of some of the more obscure genera, several of which are exclusively African.

### MELISSOTARSUS EMERY

*Melissotarsus* EMERY, 1877, Ann. Mus. Civ. Genova, vol. 9, p. 378, worker.

A genus remarkable in having part or all of the tarsal segments greatly enlarged, to as wide or nearly as wide as the tibia; the legs themselves are short and thick. The antennae are six-segmented, with a two-segmented club; the frontal carinae are closely approximated, and the thorax lacks sutures.

### *Melissotarsus compressus*, new species

Figures 28, 29

FEMALE (DEALATE): Length, 3.1 mm.; of thorax, 0.99 mm. Head in front view, excluding mandibles, broader than long, occipital margin broadly concave, sides converging anteriorly

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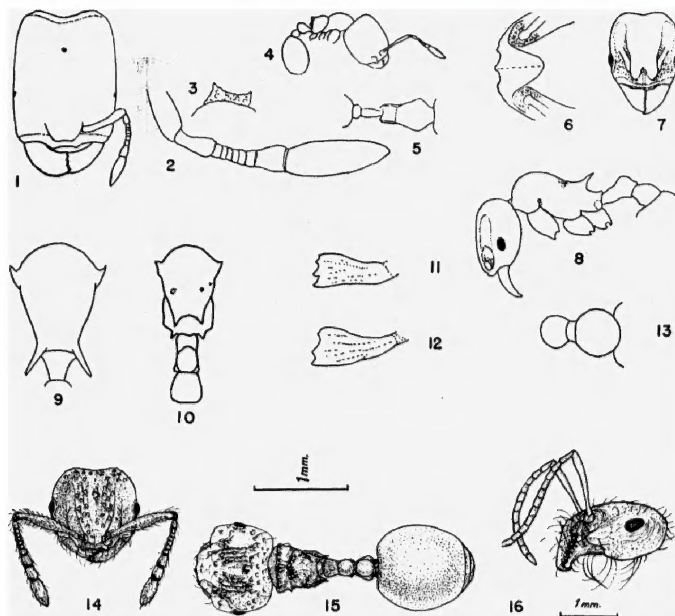


FIG. 1. *Oligomyrmex* (*Oligomyrmex*) *thoracicus* Weber. Outline of head of soldier showing the 10-segmented instead of usual nine-segmented antenna.

FIGS. 2-5. *Oligomyrmex* (*Aeromyrma*) *vorax* (Santschi). 2. Outline of antenna of soldier. 3. Outline of epinotal lamella of worker. 4. Outline of worker. 5. Outline of thorax and pedicel of worker from above. 2, 3, 5, after Silvestri; 4, after Santschi.

FIG. 6. *Hylidris myersi* Weber. Outline of front of head showing clypeus of female.

FIGS. 7, 8. *Cyphoidris spinosus*, new genus, new species. 7. Outline of head of worker. 8. Outline of worker.

FIG. 9. *Hylidris cribarius* (Arnold). Outline of thorax of female from above. After Arnold.

FIG. 10. *Hylidris africanus* (Karawaiew). Outline of thorax and pedicel of worker from above. After Karawaiew.

FIG. 11. *Hylidris myersi* Weber. Left mandible of worker, cotype.

FIG. 12. *Hylidris laevigatus*, new species. Left mandible of worker.

FIG. 13. *Cardiocondyla nilotica*, new species. Outline of nodes of pedicel of worker.

FIGS. 14, 15. *Hylidris myersi* Weber. 14. Head of worker, Kenya specimen. 15. Worker from above, Kenya specimen.

FIG. 16. *Ocymyrmex weitzeckeri* Emery. Lateral view of head of worker showing psammophore.

from the rounded occipital angles, median portion of clypeus raised as a convex disc, anterior clypeal margin sinuate, convex medially; frontal lobes feeble and convex; three conspicuous

ocelli; mandibles short, flat, triangular, with long apical tooth, a subapical tooth less than one-third as large, and a feebly denticulate basal portion of the cutting margin; eyes large, 0.27 mm. in diameter, slightly convex and separated from the occipital corners by approximately their diameters, being much closer to the anterior margin; antennal scape 0.30 mm. long, gradually enlarged apically, funiculus 0.41 mm. long, terminal segment 0.19 mm. long, slightly shorter than the remainder of the funiculus and compressed. Thorax and epinotum in profile forming a nearly smooth convexity, the declivous surface of the epinotum being plane. Petiole in profile higher than the postpetiole, conic with straight anterior border, rounded node above and ventral surface with a short, acute tooth anteriorly directed. Postpetiole evenly convex dorsally; viewed from above about one and two-fifths broader than the petiole, about one and two-thirds times broader than long, anterior margin concave, other margins convex. Gaster elongate, elliptical in outline, with four large segments visible from above and fully extended. Legs short; first tarsal segment of prothoracic leg half the length of the tibia and as long as the remainder of the segments with the claw taken together, broad and flattened, concave medially.

Lucid; head feebly striatulate and with scattered piligerous punctations, clypeus and mandibles densely punctate, thorax above evenly and closely striate longitudinally, gaster faintly and shallowly reticulate. Pilosity of scattered long, fine, yellowish, upright hairs attaining lengths up to 0.22 mm. on the frons and a sparse and widely scattered reclinate pubescence which does not conceal the integument.

Medium brown, margins of sutures, especially thoracic, antennae, sides of thorax and legs, except first tarsal segment of prothoracic leg, brownish yellow; the preceding tarsal segment a contrasting dark brown.

HOLOTYPE: One female (no. 2184)<sup>1</sup> taken in Haut Mbomu, latitude 5° 30' N., longitude 25° 15' E., Ubangi-Shari, French Equatorial Africa. The ant was found in the only patch resembling rain forest north of the Mbomu River, where the country is generally a mixed grass-woodland, thinning out north-

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<sup>1</sup> The numbers in parentheses throughout this paper refer to my permanent field note numbers and appear on the label with the ant, thus identifying the specific individuals under consideration.

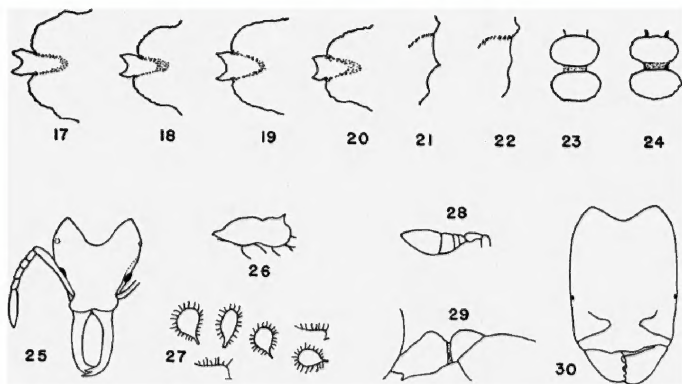


FIG. 17. *Calyptomyrmex* (*Calyptomyrmex*) *reticulatus*, new species. Clypeus and frontal lobes of worker.

FIG. 18. *Calyptomyrmex* (*Calyptomyrmex*) *brevis* Weber. Clypeus and frontal lobes of worker.

FIG. 19. *Calyptomyrmex* (*Calyptomyrmex*) *punctatus*, new species. Clypeus and frontal lobes of worker.

FIG. 20. *Calyptomyrmex* (*Calyptomyrmex*) *clavatus*, new species. Clypeus and frontal lobes of worker.

FIG. 21. *Calyptomyrmex* (*Calyptomyrmex*) *punctatus*, new species. Inner view of right epinotal declivity of worker showing lack of epinotal spine.

FIG. 22. *Calyptomyrmex* (*Calyptomyrmex*) *clavatus*, new species. Inner view of right epinotal declivity of worker showing presence of epinotal spine.

FIG. 23. *Calyptomyrmex* (*Calyptomyrmex*) *punctatus*, new species. Nodes of pedicel of worker.

FIG. 24. *Calyptomyrmex* (*Calyptomyrmex*) *clavatus*, new species. Nodes of pedicel of worker.

FIG. 25. *Microdaceton tibialis*, new species. Outline of head of worker.

FIG. 26. *Oligomyrmex* (*Aeromyrma*) *acutus*, new species. Outline of thorax of worker.

FIG. 27. *Calyptomyrmex* (*Calyptomyrmex*) *stellatus* Santschi. Squamous hairs of worker. After Santschi.

FIGS. 28, 29. *Melissotarsus compressus*, new species. 28. Outline of antennal funiculus of female. 29. Lateral view of pedicel of female.

FIG. 30. *Oligomyrmex* (*Aeromyrma*) *acutus*, new species. Outline of head of soldier.

ward to the Sahara Desert. The habitat was a gallery forest, and the ant was among leaves and sandy humus at the base of a tree with lianas and epiphytes.

*Melissotarsus weissi* Santschi was described from Brazzaville, French Equatorial Africa, and undoubtedly came from much more moist and lower rain forest. The female is represented by Santschi as having a thoracic outline with several marked con-



vexities and a much longer basal epinotal surface compared with the present species. He also does not show a ventral tooth on the petiole. His figured pedicel from above shows much different proportions, including a postpetiole campanulate in form and only slightly broader than long, although the text described it one-fourth broader than long. Arnold describes the female of *M. beccarii* Emery from South Africa as 4 mm. in length and the postpetiole "hardly more than twice as wide as long." Workers in the Museum of Comparative Zoölogy are paler and have the pedicel of different proportions.

### CARDIOCONDYLA EMERY

*Cardiocondyla* EMERY, 1869, Ann. Accad. Aspiranti Nat., Naples, vol. 2, p. 20, worker, female.

The workers of this genus have a characteristic habitus, being minute, elongate ants with rounded contours. The petiole is strongly pedunculate, while the postpetiole is much more voluminous and the gaster small. A character which has perhaps been overrated is the absence of spines on the middle and hind tibia. The new species here described compare closely in generic characters but have a fine, hair-like, tibial spine. This character alone does not appear warranting their separation as another genus.

### *Cardiocondyla emeryi* Forel

*Cardiocondyla emeryi* FOREL, 1881, Mitth. München Ent. Ver., vol. 5, p. 5, worker.

Among the dozen or so tropicopolitan species of ants is this species. The workers are minute (1.8 to 2.1 mm. long, with a thorax length of about 0.52 mm.), smooth in general habitus and finely punctate. Arnold records the South African female as 2.5 mm. long. Two females in my collection (St. Lucia, British West Indies [H. E. Box], and Jinja, Uganda, 1939 [N. A. Weber]) are 2.1 mm. long, with thorax lengths of 0.71 mm. The body of the former is dark brown, with brownish yellow appendages; the Uganda female has only the gaster dark brown, the body and appendages generally being the same light color of the former specimen.

Wheeler records the species from Congo da Lemba and Thysville, Belgian Congo, and from Arusha-chini in "German East Africa."

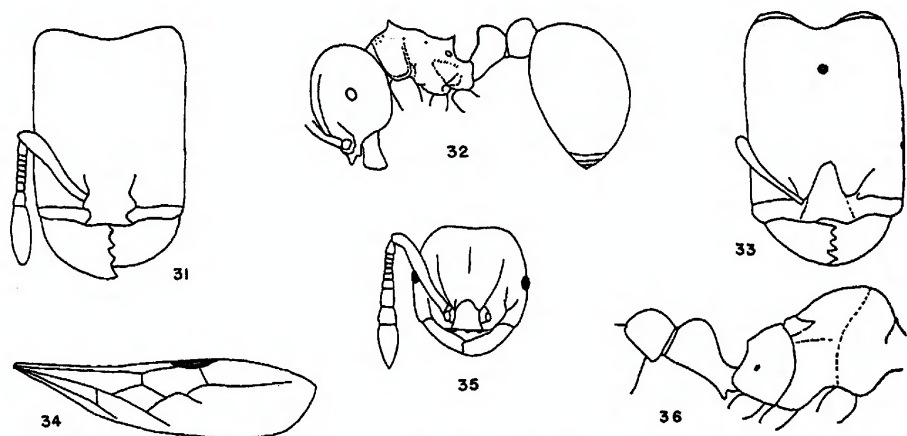


FIG. 31. *Oligomyrmex (Aeromyrma) jeanneli* Santschi. Outline of head of soldier. After Santschi.

FIG. 32. *Hylidris africanus* (Karawaiew). Outline of worker. After Karawaiew.

FIGS. 33, 34. *Oligomyrmex (Aeromyrma) debilis* Santschi. 33. Outline of head of soldier. 34. Wing of male. Both after Santschi.

FIG. 35. *Hylidris africanus* (Karawaiew). Outline of head of worker. After Karawaiew.

FIG. 36. *Oligomyrmex (Aeromyrma) debilis* Santschi. Outline of thorax and pedicel of soldier. After Santschi.

### ***Cardiocondyla emeryi* subspecies *mahdii* Karawaiew**

*Cardiocondyla emeryi* subspecies *mahdii* KARAWAIEW, 1911, Rev. Russe Ent., vol. 11, p. 8, worker.

Khartoum, Anglo-Egyptian Sudan, is the type locality, and I took a worker of this or the typical form at Port Sudan in this country in 1939. The thorax length of the worker is 0.52 mm., as in the typical form.

### ***Cardiocondyla brevispinosa*, new species**

WORKER: Length, 2.1 mm.; of thorax including neck, 0.63 mm. Head in front view, excluding mandibles, one and one-fourth times longer than broad behind eyes; occipital margin sharply impressed medially, corners rounded; sides feebly convex, slightly broader behind eyes than in front; anterior clypeal margin produced over the base of the mandibles, feebly concave in the middle; eyes large, closer to the anterior clypeal margin than to the occiput; mandibles stout, evenly convex on their outer margins, with fine teeth, of which the second basal is

minute, the basal and the third slightly larger and the fourth and the apical are distinctly larger. Antennae slender, the scape failing to reach the occipital corners by about its distal diameter, club three-segmented, about one and two-fifths times longer than the remainder of the funiculus. Thorax in side view evenly convex in the promesonotal region, meso-epinotal impression broad and shallow; basal surface of epinotum slightly convex, epinotal spines reduced to short, angular carinae between which the surface is concave, declivous surface slightly concave; thorax from above nearly one and one-half times broader through the pronotum than through the epinotum, feebly impressed laterally through the meso-epinotal region. Petiole in profile with peduncle slightly deflected downward anteriorly, anterior face of node plane and rising to an evenly convex dorsum, the posterior face convex; postpetiole slightly lower than the petiole, evenly convex dorsally; from above the postpetiole is transversely elliptical except for truncate anterior face, one and one-fifth times broader than long, one and one-half times broader than the petiole. Gaster small, ovate, with concave anterior face, one and one-fourth times longer than broad. Legs moderately long and slender.

Sublucid, head and thorax densely punctate, mesopleurae and sides of epinotum more coarsely punctate, pedicel and gaster finely and shallowly punctate to smooth. Pilosity of a sparse, fine, appressed pubescence which does not obscure the integument. General color of a yellowish brown with head except anteriorly a darker brown and gaster intermediate in color between the head and remainder of body.

HOLOTYPE: One worker (no. 2116) which I took at Beni, latitude  $0^{\circ} 24' N.$ , longitude  $29^{\circ} 24' E.$ , Belgian Congo, February 24, 1948. The ant was crawling over the grassy ground of a cultivated area.

Close to *C. badonei* Arnold but paler, the head less broad in front, the eyes not median in position, the occiput more sharply impressed medially and differing in other ways. It differs markedly from the widespread *emeryi* especially in larger size and in having greatly reduced epinotal spines.

#### *Cardiocondyla fusca*, new species

WORKER: Length, 2.1 mm.; of thorax, 0.69 mm. Head in front view, excluding mandibles, one and one-third times longer

than broad behind eyes, occipital margin broadly and slightly impressed, corners broadly rounded, anterior clypeal margin produced over the base of the mandibles and feebly concave in the middle, eyes large and convex, situated in front of the middle of the head; mandibles of five teeth, of which the second basal appears vestigial; antennae slender, the scapes failing to reach the occipital corners. Postpetiole one and three-tenths broader than long, one and three-fifths times broader than the petiole. Densely and finely punctate on the head and thorax, more coarsely on the sides of the thorax except anteriorly, smooth and shining on the gaster. Pilosity of a sparse, fine, appressed pubescence which does not obscure the integument. Dark brown, the appendages lighter.

HOLOTYPE: One worker (no. 1495) which I took at Jinja, Uganda, August 15, 1939. The ant was, with workers of *Odontomachus* and a formicine, at the very edge of the Ripon Falls from which the Albert Nile issues. On the rocks forming the base of the falls were small clumps of grasses and sedges in which the ants may have been nesting. The ants could have fed upon flies, Trichoptera, and other animals brought up by the swirling water hardly 1 meter below this site.

Less than 1 mile distant a dealate female of the tropicopolitan *emeryi* was taken on the same day on the Hotel Ibis grounds in a cultivated area.

This species is closely related to *C. brevispinosa*, new species, but is markedly darker, has the petiolar node rising more abruptly and more convexedly, and has the gaster smooth instead of punctate. With more specimens for comparison they may be considered closely related subspecies.

### **Cardiocondyla nilotica, new species**

Figure 13

WORKER: Length, 2.5 mm.; of thorax including neck, 0.75 mm. Head in front view, excluding mandibles, one and one-fifth times longer than broad behind eyes, occipital margin feebly concave, corners broadly rounded, sides slightly convex, anterior clypeal margin extended over the mandibles, feebly concave in the middle; antennae slender, scapes distinctly exceeding the occipital corners, club three-segmented, one and two-fifths times longer than the remainder of the funiculus;



eyes large, convex, situated closer to the anterior than to the posterior border of the head; mandibles with fine teeth, of which the apical two are largest and the others are of uniform size. Thorax in profile without promesonotal suture and with a broad, rounded, meso-epinotal impression, epinotum with long, feebly convex basal surface and short, triangular tubercles instead of spines; thorax from above broadest through the pronotum where about three-tenths broader than through the epinotum. Petiole with slender peduncle and sharply rising node, the latter evenly convex above; postpetiole slightly higher than the petiole, evenly convex above, one and one-half times broader than the petiole, slightly broader than long and slightly concave anteriorly. Gaster ovate, truncate anteriorly, about one and four-tenths longer than broad. Legs moderately long and slender.

Sub-lucid, body densely and finely punctate except on the gaster which is smooth and shining. Pilosity of a short, fine, sparse pubescence which does not obscure the integument. Bright ferruginous, the head with a dark area dorsally, the thorax, pedicel, and legs pale and the gaster dark brown.

HOLOTYPE: One worker (no. 1234) which I took at Ed Dueim in latitude  $14^{\circ} 00' N$ . on the White Nile River, Anglo-Egyptian Sudan, July 2, 1939. The ant was crawling on the bare sandy ground of the beach in the vicinity of nests of *Brachyponera sennaarensis* Mayr.

Close to *C. brevispinosa*, new species, but slightly larger, with longer antennal scapes, less impressed occipital margin, more slender thorax, less broad postpetiole, smoother gaster, and brighter color.

#### OLIGOMYRMEX (OLIGOMYRMEX) MAYR

*Oligomyrmex* MAYR, 1867, Tijdschr. v. Ent., vol. 10, p. 110.

Descriptions and figures of the African species have recently been published (Weber, 1950). The close relationship with *Aeromyrma* is described below.

#### *Oligomyrmex* (*Oligomyrmex*) *thoracicus* Weber

Figure 1

*Oligomyrmex thoracicus* WEBER, 1950, Amer. Mus. Novitates, no. 1442, p. 13, soldier, worker.

The type specimens came from one cell and its adjacent tunnels in rotted wood buried in humus and leaves at the base of a tree. In investigating this colony additional ants were collected in the immediate vicinity at the base of the same tree and included the strikingly different species *convexus*. Several 10-segmented soldiers were also taken which were ascribed to *Aeromyrma*.

One was a replete and had a distended gaster. Another had a contracted gaster of normal size. The lengths were 2 to 2.4 mm. with thorax lengths 0.66 to 0.70 mm. One (no. 2087) had a petiolar node 0.19 mm. broad which was 0.06 mm. long at the apex; its postpetiolar node was 0.23 mm. broad by 0.13 mm. long. Another (no. 2080) had the petiolar node 0.17 mm. broad, the postpetiolar node 0.23 by 0.14 mm. A third (no. 2080A) had the head with closed mandibles 0.88 by 0.56 mm., the tangential length of the scape 0.27 mm., the funiculus 0.38 mm. long, and the antennal club 0.23 mm. long. A fourth (no. 2080D) has a 10-segmented antenna on one side and nine segments on the other. These measurements supplement those given for *thoracicus* since the soldiers are otherwise similar to the nine-segmented soldiers of *thoracicus*. The extra antennal segment has been added to the small series between the first funicular and the club. Variation in the antennal segment has been noted in *Acropyga*, subgenus *Rhizomyrma*, where an additional segment may be added by a splitting of one (Weber, 1944, Ann. Ent. Soc. Amer., vol. 37, p. 102 for *A. wheeleri* Mann, pp. 99 and 105 for *A. rutgersi* Bunzli, and pp. 99 and 120 for *A. guianensis* Weber).

It hardly seems possible that there could be three species of ants, *convexus*, *thoracicus*, and a third belonging to *Aeromyrma*, in this small area of a few square decimeters, and the last two are here considered conspecific.

#### OLIGOMYRMEX SUBGENUS AEROMYRMA FOREL

*Aeromyrma* FOREL, 1891, Ann. Soc. Ent. Belgique, vol. 35, pp. cccvii-cccviii.

The status of *Aeromyrma* rests primarily on the 10-segmented condition of the soldier and worker castes compared with the nine-segmented condition in *Oligomyrmex*, these castes otherwise being indistinguishable. While both have 13-segmented antennae in the male, as is customary, the *Oligomyrmex* female

genotype had nine-segmented antennae compared with 11 segments in the female *Aeromyrma* genotype. The discovery in *A. debilis* Santschi of a 10-segmented soldier and a worker with nine segments casts doubt upon the generic status of *Aeromyrma*, which was described 24 years after *Oligomyrmex*. The present description of both nine- and 10-segmented soldiers in *O. thoracicus* Weber makes the generic status of *Aeromyrma* still more doubtful, as does the discovery of both a worker and a soldier with nine segments on one side and 10 on the other. Since very few females have been associated with either genus, there is no real information on the variability of this caste. The two are obviously very closely allied, and *Aeromyrma* is here retained as a subgenus of *Oligomyrmex*.

#### AFRICAN SPECIES OF *Oligomyrmex* (*Aeromyrma*)

*acutus*, new species  
*africana* (Forel), 1910  
*arnoldiella* Santschi, 1919  
*debilis* Santschi, 1913  
*hewitti* Santschi, 1919  
*incertus* Santschi, 1919  
*jeanneli* Santschi, 1914  
*lucidus* Santschi, 1916  
*nanus* Santschi, 1919  
*petulca* (Wheeler), 1922  
*semilaevis* (Mayr), 1901  
*traegaardhi* (Santschi), 1914  
*ugandana* (Santschi), 1923  
*vorax* (Santschi), 1913

#### KEY TO THE 10-SEGMENTED SOLDIERS OF *Oligomyrmex* (*Aeromyrma*)

1. Length over 2 mm. .... 2  
 Length 1.7 mm., no pre-occipital carinae, mandibles five-dentate, scape attaining middle of head, head mostly smooth and shining except for finely striate frons and vertex. .... *jeanneli*
2. Length 2-2.5 mm. .... 3  
 Length 2.7-2.9 mm., with pre-occipital carinae, mandibles six-dentate, scape hardly exceeds middle of head, head glossy, finely reticulate. .... *africana*
3. Occipital border hardly impressed. .... 4  
 Occipital border deeply impressed. .... 5
4. Eyes distinct, head longitudinally striate anteriorly, transversely striate posteriorly, with occipital angles somewhat reticulate, postpetiole one and two-thirds times broader than long. .... *semilaeve* and *hewitti*  
 Eyes indistinct, head striate. .... *arnoldiella*

5. Occipital corners rounded and right-angled or obtuse.....6  
Occipital angles acute, head 0.87 by 0.55 mm., thorax including neck 0.60 mm., epinotal spines well developed.....*acutus*
6. Epinotum dentate, head 0.84 by 0.55 mm., thorax 0.63 mm., postpetiole twice as broad as long.....*petulca*  
Epinotum not dentate, size larger, postpetiole about one and two-thirds times broader than long.....*debilis*

KEY TO THE 10-SEGMENTED WORKERS OF  
*Oligomyrmex (Aeromyrma)*

1. Length under 1 mm.....2  
Length over 1 mm.....4
2. Antennae 10-segmented.....3  
Antennae nine-segmented, head one-sixth longer than broad, scape attains posterior fifth of head, postpetiole one and one-half times broader than long ..... *debilis*
3. Mandibles four-dentate, antennal scape attaining posterior third of head, postpetiole almost twice as broad as long.....*jeanneli*  
Mandibles five-dentate, head except frons densely reticulate; epinotal declivity with a translucent lamella on each side, postpetiole twice as broad as long.....*vorax*
4. Eyes absent, length 1-1.2 mm., postpetiole one and one-third times broader than long, head smooth and shining.....*arnoldiella*  
Eyes present, sometimes atrophied.....5
5. Length 1.1-1.2 mm.....6  
Size larger.....8
6. No epinotal spines.....7  
Epinotal spines distinct, head 0.42 by 0.31 mm., thorax 0.38 mm..*acutus*
7. Mandibles four- to five-dentate, scape reaches posterior fourth of head, no epinotal lamellae.....*semilaevis*  
Mandibles five-dentate, head slightly over one and one-fourth times longer than broad, postpetiole almost one and one-half times broader than petiole .....*lucidus*
8. Head fully one and one-fifth times longer than broad, petiolar node pointed above, postpetiole one and one-half times broader than petiole...*incertus*  
Head one and one-seventh times longer than broad, petiolar node low and rounded, postpetiole one and one-third times broader than petiole. *nanus*
9. Head one and one-sixth times longer than broad, dull brownish yellow, robust in habitus.....*ugandana*  
Head narrower, color paler, habitus more slender.....*traegaardhi*

***Oligomyrmex (Aeromyrma) acutus*, new species**

Figures 26, 30

SOLDIER: Length, 2.1 mm.; head 0.87 mm. long, including closed mandibles, by 0.55 mm. wide; thorax including neck, 0.60 mm. Head in front view with broadly and deeply impressed occiput, the corners acute and carinate, sides subparallel,



slightly broader posteriorly and converging to the occiput; eyes minute, situated in front of the middle of the head; anterior clypeal margin sinuate, broadly and feebly impressed medially; mandibles with about five stout teeth; antennae 10-segmented, scape strongly bowed, extending slightly past a level with the eyes but not so far as the middle of the head, 0.27 mm. in tangential length; funiculus 0.36 mm. long. Thorax with deep meso-epinotal impression and well-developed triangular epinotal teeth, pronotum expanded laterally and broader than long. Petiole pedunculate, with high node expanded above and broadly impressed in the middle, node approximately 0.15 mm. broad. Postpetiole approximately 0.19 mm. broad, 0.13 mm. long, transversely elliptical. Gaster short and ovate, with sub-lobate anterior angles at each side. Hind femur, 0.32 mm.; tibia, 0.26 mm.; tarsi including claw, 0.44 mm.; first tarsal segment 0.21 mm. long.

Head reticulate-punctate, striate anteriorly; color brown, with head markedly paler than gaster.

WORKER: Length, 1.1 mm.; head including closed mandibles, 0.42 mm. long by 0.31 mm. broad; thorax including neck, 0.38 mm. Head in front view ovate, with slightly impressed occiput; eyes minute, situated in front of middle of head; mandibles with about five acute teeth; antennae 10-segmented, scape 0.21 mm. in tangential length and extending to the posterior fifth of the head, funiculus 0.34 mm. long, terminal segment 0.15 mm. long by 0.05 mm. broad. Thorax in profile with slight, even, promesonotal convexity descending evenly to the broadly impressed meso-epinotal impression; basal surface of epinotum convex, epinotal spines triangular and acute. Petiole in profile concave dorsally, convex ventrally, node broad at summit and slightly higher than postpetiole. Postpetiole nearly one and one-half times broader than the petiole. Gaster ovate. Legs moderately long and slender, the anterior comb large.

Shining, head striate anteriorly.

Pilosity of reclinate short hairs, especially numerous on head, and more scattered, longer, and upright hairs.

Brown appendages slightly paler.

HOLOTYPE: One soldier taken March 17, 1948, 10 kilometers east of Stanleyville, Belgian Congo. The ant was mounted on a slide, and details of sculpture and pilosity do not show.

PARATYPES: Five workers taken with the soldier.

The ants were taken among leaf mold and humus on top of the fallen log which contained the type colony of *Parasyscia nitida* Weber. The habitat was heavy rain forest and, while termites were also here, there was no apparent relationship between the two.

The distinctive feature of the soldier is the acute occipital angles which in other species are rounded or more right-angled. The worker has a marked meso-epinotal impression and unusually long epinotal teeth.

#### BIOLOGY OF *Oligomyrmex* AND *Aeromyrma*

While these ants rank as among the very smallest of the ants of the world, they are by no means unimportant. Their size may be an asset in enabling them to penetrate small orifices or to attack small animals. Silvestri (1914, p. 128) records the workers of *A. vorax* as destroying pupae of *Ceratitis colae*, a fruit fly, at Aburi, West Africa. "It makes a small opening in the puparium, then penetrates within and little by little destroys the whole pupae."

They appear to be primarily terrestrial or hypogeic, and I found them regularly in Kenya termitaria. Their small size enables them to use the smallest entrances to a termite cell, and quite possibly the brood of termites constitute an important and regular source of food. They could always be found in the peripheral soil and humus cover of a large *Macrotermes natalensis* termitarium over a period of several weeks in January and February. Termites, however, would not necessarily constitute their only food since snails (*Opeas*) and many other invertebrates including other species of ants lived here. A similar situation occurred in a *natalensis* mound at Zemio, French Equatorial Africa.

The Uganda type colony of *O. thoracicus* was a few meters distant from a large termitarium of *Macrotermes natalensis* containing six large queens, and it is quite possible that there may have been some relationship here which could not be determined in the limited time available. In a Belgian Congo termitarium of another genus, however, *Crematogaster*, *Pheidole*, and *Aeromyrma* all nested in peripheral termite chambers and probably all were predatory on their host. The type soldier of *A. petulca* was taken from a termitarium.

Not only do the termitaria furnish food but they conserve moisture which enables the ant brood to exist in the cells under arid conditions during dry seasons. The ants which nest in rotted wood or in earth cells under a leaf cover in scrub forest also find relatively high and constant humidity. Since they are minute in size, it is the microclimate that is important for them, for food is everywhere. They are regular inhabitants of the earth and humus of rain forests and have become widespread throughout tropical Africa.

### PRISTOMYRMEX MAYR

*Pristomyrmex* MAYR, 1866, Verhandl. Zool. Bot. Gesellsch. Wien, vol. 16, p. 903.

The genotype, *P. pungens* Mayr, 1866 (*loc. cit.*), is coarsely sculptured, lacks pronotal tubercles or spines, has long epinotal spines, lacks smooth antennal scrobes, and has the median carina of the clypeus well developed. It is generically different from *Hylidris myersi* Weber, 1941, but clearly related. Of nine identified species attached to *Pristomyrmex* in the Museum of Comparative Zoölogy, all from the Indo-Malayan, Chinese, and Australasian regions, two are heavily sculptured as in the genotype and show other similarities; seven are mostly smooth and shining. While most lack pronotal spines or tubercles, *P. picteti* Emery and *P. quadridentatus* André of Australia have spines. The nodes of the pedicel of *quadridentatus*, *laevigatus* Emery of the Philippines, and *mandibularis* Mann of Fiji are similar to those of *Hylidris myersi* though differing in other characters.

It is obvious here, as in such genera as *Tetramorium*, that we are dealing with a complex of species differing greatly among themselves yet having certain characters in common. The weight attached to these characters will differ widely among investigators and as more species become known, or as study becomes more critical, the tendency will be to split up these large, heterogeneous genera into more homogeneous aggregates of species. These, of course, should have a common ancestor, but evidence will be limited. There exist between recognized genera species with intermediate characters, even between such different genera as *Tetramorium* and *Calyptomyrmex*; *T. scrobiferum* Emery is stated to approach *Calyptomyrmex* in several distinctive characters.

Mayr emphasized in his original description of the genus the close relationship with *Tetramorium*, *Pristomyrmex* differing especially in having 11-segmented antennae and in clypeal characters ("clypeus trapezoideus inter antennarum articulationes intersertus, antice latior, postice angustior, planus, porrectus, antice protecto simile mandibulas partim tegens . . ."). The pronotum, of course, is not described in the generic description as having tubercles or spines, since they were absent in the genotype. He also called attention to the similarity of its petiole with that of *Myrmecina* ("Petioli articulus primus non petiolatus, supra postice nodo rotundato-transverso, parum, elevati . . .").

The tribe Myrmecini of Ashmead (Emery emend.), to which *Pristomyrmex* and *Hylidris* belong, lacks positive characters and was considered by Emery a residue containing ancient groups. He listed it between Meranoplini and Tetramoriini. Meranoplini was for long considered to be paleotropical, until new genera were taken in the American tropics. Myrmecini also was entirely paleotropical except for the holarctic *Myrmecina*, but genera in the American tropics would be expected to occur. Tetramoriini is world wide though chiefly paleotropical.

The species listed below from Africa which have been attached to *Pristomyrmex* with variable uncertainty, as shown by their citations, differ markedly from the *Pristomyrmex* genotype and original description. They have much in common with the genotype of *Hylidris* and should be transferred to *Hylidris*.

At the present time, therefore, no species of *Pristomyrmex* are known from Africa. This great continent has a large and diverse fauna of *Tetramorium* species. Whether any of these show clear affinities with *Pristomyrmex* remains to be demonstrated.

#### HYLIDRIS WEBER

*Hylidris* WEBER, 1941, Ann. Ent. Soc. Amer., vol. 34, pp. 184, 190, worker; 1943, Bull. Mus. Comp. Zool., Harvard Coll., vol. 93, p. 316.

The genus *Hylidris* is marked distinctively by its 11-segmented antennae, dentate clypeus produced as a lobe over the base of the clypeus, angular thorax with pronotal angularities, tubercles or spines, epinotal teeth, smooth and shining integu-



ment, and usually large, shallow punctations on the head and thoracic dorsal surface.

To this genus belong the following described species and, following this list, the new species and subspecies.

### **Hylidris africanus (Karawaiew)**

Figures 10, 32, 35

*Pristomyrmex africanus* KARAWAIEW, 1931, Zool. Anz., vol. 95, p. 47, worker. MENOZZI, 1942, Zool. Anz., vol. 14, p. 16. DONISTHORPE, 1944, Proc. Roy. Ent. Soc., London, vol. 13, pts. 7-8, p. 84.

The original description and figures of *africanus* show a close similarity to *myersi*. The length ("etwa 2 mm.") indicates a much smaller ant, since *myersi* is fully 3 mm. and the worker as it walks is about 2.5 mm. The mandibles are fundamentally similar, though the *africanus* mandible is figured as lacking the bidentate basal lobe on the cutting surface. The *africanus* clypeus is represented as having three equal teeth on the anterior surface instead of one median and several much smaller denticles. The episternal angles are much less lobate in the *africanus* figure and the petiolar peduncle much broader. The punctations of the head are much more numerous. Despite these differences the two species appear closely related. Unfortunately *africanus* is based on one worker which presumably is in Ukraina.

DISTRIBUTION: British East Africa.

### **Hylidris cribarius (Arnold)**

Figure 9

*Pristomyrmex cribarius* ARNOLD, 1926, Ann. South African Mus., vol. 23, p. 281, female; 1948, Occas. Papers Natl. Mus. Southern Rhodesia, no. 14, p. 222, worker.

DISTRIBUTION: Portuguese East Africa, Zululand.

### **Hylidris fossulatus (Forel)**

*Tetramorium (Xiphomyrmex) fossulatum* FOREL, 1910, Ann. Soc. Ent. Belgique, vol. 54, p. 428, worker.

*Xiphomyrmex fossulatus*, WHEELER, Bull. Amer. Mus. Nat. Hist., vol. 45, p. 908.

*Tetramorium fossulatum*, SANTSCHI, 1914, Boll. Lab. Zool. Gen. Agr. Portici, vol. 8, p. 368.

*Pristomyrmex fossulatus*, SANTSCHI, 1923, Rev. Zool. Africaine, vol. 12, p. 286. MENOZZI, 1942, Zool. Anz. vol. 14, p. 164. DONISTHORPE, 1944, Proc. Roy. Ent. Soc. London, vol. 13, pts. 7-8, p. 84. EIDMANN, 1944, Zool. Jahrb., vol. 76, p. 453.

DISTRIBUTION: Natal, Fernando Po.

### *Hylidris orbiceps* (Santschi)

*Xiphomyrmex orbiceps* SANTSCHI, 1914, Boll. Lab. Gen. Agr. Portici, vol. 8, p. 367, worker. WHEELER, 1922, Bull. Amer. Mus. Nat. Hist., vol. 45, p. 908.

*Pristomyrmex orbiceps*, SANTSCHI, 1923, Rev. Zool. Africaine, vol. 12, p. 286. MENOZZI, 1942, Zool. Anz., vol. 14, p. 164. DONISTHORPE, 1944, Proc. Roy. Ent. Soc. London, vol. 13, pts. 7-8, p. 84. EIDMANN, 1944, Zool. Jahrb., vol. 76, p. 453.

DISTRIBUTION: Cameroon, Gold Coast.

### *Hylidris myersi* Weber

Figures 6, 11, 14, 15

*Hylidris myersi* WEBER, 1941, Ann. Ent. Soc. Amer., vol. 34, p. 190, worker; 1943, Bull. Mus. Comp. Zool. Harvard Coll., vol. 93, p. 316.

FEMALE (DEALATE): Length extended, 3.5 mm.; of thorax, including neck, 1.0 mm. Similar to the worker except for the usual sexual differences. The mandibles bear two well-developed teeth and a basal lobe which is feebly bituberculate; anterior clypeal margin with a median tooth, a lateral tubercle on each side, and faint indications of an outer tubercle on each side; occipital margin distinctly impressed; anterior ocellus minute but distinct and 0.025 mm. in diameter, lateral ocelli difficult to distinguish from the coarse punctations. Pronotum with a distinct pair of anterior teeth, mesonotum raised and separated anteriorly by a fused suture from the pronotum; epinotal spines and episternal angles as in worker. Pedicel as in worker. Sculpture, pilosity, and color as in worker.

GYNETYPE: One female (no. 2041) taken February 5, 1948, in Kenya near the Tanganyika frontier, approximately in latitude  $1^{\circ} 38' S.$ , longitude  $35^{\circ} 17' E.$  The ant was in a comparatively densely wooded donga with high trees and was among the leaf and humus cover on the forest floor. In life the field characters noticeable to the naked eye were the slow walk with antennae outspread, the large head, and the shiny dark brown gaster appearing black. The ant "feigned death" momentarily. This donga was also the habitat of *Phrynoponera*

*gabonensis* (E. André) and *Discothyrea patrizii* Weber, among other ants.

DISTRIBUTION: Anglo-Egyptian Sudan, Kenya, Uganda.

NEW RECORDS: Same locality as the above in Kenya, workers (nos. 2023, 2026), February 1-2, 1948, from old, shaded termite mound serving as the bivouac of a colony of *Dorylus* (*Anomma*) *nigricans* subsp. among leaves, of another termite mound (probably *Macrotermes natalensis*). Uganda: Fort Portal, February 21, 1948, from among wet leaves and humus under dense, spiny bushes, one worker (no. 2103). The pronotal tubercles are blunted, and the color is darker than in the other specimens.

#### ***Hylidris myersi* subspecies *mbomu*, new subspecies**

WORKER: Length extended, 2.7 mm.; of thorax, including neck, 0.78 mm. A paler form with more acute thoracic and epinotal spines. The antennal fossa is entirely marginate and extends to a level with the eyes; the frontal carinae extend to within half the distance between the eyes and the occiput. The pronotal spines are acute and directed slightly forward; the epinotal spines are of similar form but longer and directed upward; both nodes of the pedicel are laterally compressed. Head, thorax, and abdomen are a clear, medium brown distinctly paler than the typical form, with the legs a yellowish brown which is also paler than the legs of the typical form.

HOLOTYPE: One worker (no. 2210) taken March 12, 1948, 5 miles west of Bangassau, Bas Mbomu, Ubangi-Shari, French Equatorial Africa. The ant was among damp leaves and humus under gallery forest. This was also the site of *Asphinctopone lucidus* Weber and *Hylidris laevigatus*, new species. From the latter, the present form differs markedly in its well-developed thoracic spines, compressed nodes of pedicel, greater punctation, and lighter color.

#### ***Hylidris myersi* subspecies *primus*, new subspecies**

WORKER: Length, 2.7 mm.; of thorax, including neck, 0.78 mm. A form differing from typical *myersi* largely in its more slender epinotal spines and backward curving row of punctations on the meso-epinotal region. This site is faintly indicated in the typical form but is distinct in *primus*. From above,

the pits form a crescentic row, with the open horns directed forward to the sides of the mesonotum and with the center deeply impressed. The color of the body is a dark brown, with the legs a contrasting yellowish brown.

**HOLOTYPE:** One worker (no. 2235) taken March 19, 1948, at Stanleyville, Belgian Congo. The ant was in leaf cover at the edge of the Hotel Sabena clearing where thick, low forest begins.

***Hylidris myersi* subspecies *beni*, new subspecies**

**WORKER:** Length extended, 2.6 mm.; of thorax, including neck, 0.73 mm. A form differing primarily in having the pronotal spines reduced to tubercles and the petiolar node thinner and more directed forward. The occipital margin is impressed, the anterior clypeal margin bears the median tooth and in addition a pair of tubercles on each side; the mandibles bear an apical pair of teeth and in addition a feebly bituberculate basal lobe as in the related forms. Color slightly darker than in the typical *myersi*.

**COTYPES:** Three workers (no. 2129) taken February 25, 1948, 15 miles north of Beni, Belgian Congo. The ants were in the ground cover of second-growth rain forest.

This form may be somewhat transitional to *fossulatus* (Forel), which is represented as having a straight rather than impressed occipital margin and with an even narrower petiolar node.

***Hylidris laevigatus*, new species**

**Figure 12**

**WORKER:** Length extended, 3 mm.; of thorax, 0.88 mm. Head in front view, including closed mandibles, suborbicular, with occipital margin truncate, excluding mandibles as broad back of eyes as long; eyes 0.18 mm. in diameter, convex and situated about one and one-third times their diameters from the mandibular insertions; anterior clypeal margin produced as a convex, denticulate lobe over the bases of the mandibles, the medial portion with five denticles of comparable size, of which the median is the continuation of a median clypeal carina; frontal carinae convex and continued to a level with the posterior margin of the eyes; scrobes broad and shallow, the antennal fovea being delimited posteriorly by a lateral carina which



curves backward and medially to join the frontal carinae; mandibles short, stout, and convex, with the cutting margin vertical to the clypeal plate, bearing two teeth and a truncate lobe which probably represents one or two additional teeth. Promesonotum without teeth but with two pairs of low tubercles; in side view the thorax is evenly convex to the epinotal spines and without trace of sutures, pronotum descending abruptly and forming a sharp angle with the dorsum; epinotal spines broadly triangular. Petiole above with rounded node rising from a trapezoidal base, the dorsal surface slightly broader than long; postpetiole above also with rounded node rising from trapezoidal base, the whole one and four-tenths times broader than long and one-third broader than the petiole. Petiole in side view broadly pedunculate, with squarish node rising steeply and rounded above; postpetiole also with thick node rounded above. Gaster small and ovate. Legs moderately long and slender, femora incrassate.

Smooth and shining, with very few scattered, large, shallow punctations, of which four occur on the frontal carinae on each side posterior to the antennal insertions. Pilosity on the body reduced to a very few long, curved hairs, four being on the head in front and a few being at the apical tip of the gaster and at the anterior clypeal margin, appendages with a moderately abundant, short pilosity. Pubescence reduced to a few widely scattered and minute hairs.

Head and thorax castaneous, abdomen and legs a deep, clear brown, antennae darker.

HOLOTYPE: One worker (no. 2170.1) taken 13 miles south of Asa, Belgian Congo, approximately in latitude  $4^{\circ}40'$  N., longitude  $25^{\circ}40'$  E., March 3, 1948. The ant was collected in savanna country but in a patch of rain forest and was among leaves and humus of the ground cover, wet from the day's rain. Two additional workers were taken.

Workers (nos. 2103, 2210) at Fort Portal, Uganda, February 21, 1948, in heavy rain forest and 5 miles west of Bangassou, Bas Mbomu, French Equatorial Africa, March 12, 1948, in gallery forest.

Close to *orbiceps* (Santschi) but differing from Santschi's figures in having the anterior clypeal margin not angularly projecting, the frontal carina convex instead of largely straight, the head truncate behind instead of evenly convex and having

shorter epinotal spines; the mandibles of *orbiceps* are described as smooth, and there are other differences.

Differing from *fossulatus* (Forel) in having greatly reduced pronotal spines, having broader epinotal spines, and having the nodes of the petiole very differently shaped.

A cotype of *H. myersi* Weber differs markedly in having pronotal spines, compressed petiolar node and many more coarse, piligerous punctations, as well as having head, thorax, abdomen, and appendages of paler shades of brown than the corresponding parts in the present species.

### CALYPTOMYRMEX EMERY

*Calyptomyrmex* EMERY, 1887, Ann. Mus. Civ. Genova, vol. 25, p. 472.

A curious hypogeic or terrestrial genus of stout, compact habitus with the integument largely concealed by squamate hairs.

Prior to 1922 most of the African species belonged to the 11-segmented subgenus *Dicroaspis* rather than to the 12-segmented subgenus *Calyptomyrmex*.

The African species of the typical subgenus now are:

- arnoldi* (Forel), 1913, Ann. Soc. Ent. Belgique, vol. 67, p. 115, worker. Arnold, 1917, Ann. South African Mus., vol. 14, p. 360, worker. Bulawayo, Rhodesia.
- arnoldi* subsp. *hartwigi* Arnold, 1948, Occas. Papers Natl. Mus. Southern Rhodesia, no. 14, p. 220, worker. Pretoria, South Africa.
- brevis* Weber, 1943, Bull. Mus. Comp. Zool. Harvard Coll., vol. 93, p. 366, worker. Imatong Mountains, Anglo-Egyptian Sudan.
- brunneus* Arnold, 1948, Occas. Papers Natl. Mus. Southern Rhodesia, no. 14, p. 221, worker. Transvaal.
- cataractae* Arnold, 1926, Ann. South African Mus., vol. 23, p. 283, worker. Victoria Falls, Rhodesia.
- cataractae* subsp. *litoralis* Arnold, 1948, Occas. Papers Natl. Mus. Southern Rhodesia, no. 14, p. 221, worker. Zululand.
- clavatus*, new species. Kenya.
- nummulitica* Santschi, 1914, Boll. Lab. Zool. Gen. Agr. Portici, vol. 8, p. 352, worker. Victoria, Cameroon.
- piripilis* Santschi, 1923, Rev. Zool. Africaine, vol. 11, p. 282. Manyema Niemba-Tengo, Belgian Congo.
- punctatus*, new species. Kenya.
- reticulatus*, new species. Beni, Belgian Congo.
- stellatus* Santschi, 1915, Ann. Soc. Ent. France, vol. 84, p. 255, worker. Gaboon, French Congo.

**Calyptomyrmex (Calyptomyrmex) brevis** Weber

Figure 18

*Calyptomyrmex (Calyptomyrmex) brevis* WEBER, 1943, Bull. Mus. Comp. Zool. Harvard Coll., vol. 93, pp. 317, 366, worker.

This is an unusually pale species and lacks epinotal spines. The eyes are 0.04 mm. in diameter, the thorax length is 0.7 mm., the petiolar node is twice as broad as long, the postpetiole is only slightly broader than the petiole and is less than twice as broad as long, in addition to the characters of the original description. The type locality is the Imatong Mountains, Anglo-Egyptian Sudan.

A not unexpected discovery was a worker (no. 2124.2) of this species taken February 24, 1948, 17 miles north of Beni in the Ituri Forest, Belgian Congo. The ant occurred in the same locality as *C. reticulatus*, new species, a very different form. The site is one of dense rain forest of which the Sudan region is an extension.

**Calyptomyrmex (Calyptomyrmex) clavatus**, new species

Figures 20, 22, 24

WORKER: Length extended, 2.8 mm.; of thorax, 0.75 mm. Head in front view, including closed mandibles, 0.78 mm. long by 0.65 mm. broad, occipital margin truncate, corners broadly rounded, sides converging to the clypeus whose anterodorsal angle is produced as a pair of divergent teeth, clypeus continued backward as a flat, triangular impression; frontal lobes broad and convex; mandibles with five or six teeth; eyes 0.09 mm. in diameter and situated 1.4 mm. from the posterior margin of the antennal scrobe; antennae 12-segmented, with the three-segmented club about twice the length of the remainder of the funiculus. Thorax in profile with high promesonotum becoming truncate posteriorly and descending vertically to the mesoepinotal impression; basal surface of epinotum plane and nearly as long as the declivous surface, the two areas separated by small epinotal teeth. Petiole in profile pedunculate, the node with subparallel anterior and posterior faces, dorsally rounded, fully one-third higher than the postpetiole; petiolar node from above transversely elliptical, 0.27 mm. wide; postpetiole from above with convex sides converging posteriorly and 0.28 mm. wide. Gaster ovate, truncate anteriorly.

Head rugulose-punctate above, with rugulosities diverging posteriorly and becoming reticulate at the occiput. Thorax and pedicel above vermiculate-reticulate and punctate; gaster granulose. Pilosity of numerous, short, upright clavate hairs.

Ferruginous, the appendages paler than the body.

HOLOTYPE: One worker (no. 2000) taken January 27, 1948, in latitude  $1^{\circ}25'$  S., longitude  $35^{\circ}10'$  E., Kenya, from the shaded side of a *Macrotermes natalensis* termitarium. The ant was among leaves and humus on the periphery.

This species is noteworthy in possessing clavate instead of squamate hairs, most strikingly on the gaster, and short epinotal spines.

**Calyptomyrmex (Calyptomyrmex) punctatus**, new species

Figures 19, 21, 23

WORKER: Length extended, 3.1 mm.; of thorax, 0.85 mm. Head in front view, including closed mandibles, 0.87 mm. long by 0.78 mm. broad, occipital margin truncate, corners broadly rounded, sides converging to the clypeus whose anterodorsal angle is produced as a pair of teeth, clypeus continued backward as a flat, triangular impression; frontal lobes broad and convex in front; mandibles with three apical teeth and five much smaller denticles on the cutting margin; eyes 0.056 mm. in diameter and situated 1.16 mm. from the posterior margin of the antennal scrobe; antennae 12-segmented, with the three-segmented club 1.8 times the length of the remainder of the funiculus and slightly shorter than the scape. Thorax in profile with high promesonotum terminated by an angularity at the meso-epinotal impression; epinotum with a rounded angle instead of teeth separating the basal and declivous surface. Petiole in profile pedunculate, the node rising by an even concavity, the anterior and posterior faces not parallel, fully one-third higher than the postpetiole; petiolar node from above transversely elliptical, 0.28 mm. wide; postpetiole from above of comparable form and 0.29 mm. wide, with a prominent tooth ventrolaterally. Gaster ovate-truncate anteriorly. First tarsal segment of hind leg 0.35 mm. long and one and four-tenths times longer than the remaining segments taken together.

Head rugulose-punctate above, thorax and pedicel above vermiculate-punctate; gaster granulose. Pilosity of numerous short, squamate hairs.



Ferruginous.

Differing from *clavatus* largely in having no epinotal spines, much smaller eyes, and in having squamate instead of clavate hairs which give a superficially much different appearance.

HOLOTYPE: One worker (no. 2039) taken February 4, 1948, in latitude  $1^{\circ}38'$  S., longitude  $35^{\circ}17'$  E., Kenya. The ant was among leaves, twigs, and humus in dense shade under low forest beside a stream which had much more luxuriant vegetation than occurs generally in this region of high plains (approximately 5500 feet).

***Calyptomymex (Calyptomymex) reticulatus*, new species**

Figure 17

WORKER: Length extended, 3.4 mm.; of thorax, 1.05 mm. Head in front view, including closed mandibles, 1.0 mm. long by 0.96 mm. broad, occipital margin and angles forming a broad convexity with sides strongly converging anteriorly; anterodorsal angle of clypeus produced as a bidentate lobe; frontal lobes with lateral margins angularly sinuate, convex anteriorly; mandibles with an apical tooth and six to eight denticles of irregular development; eyes 0.075 mm. in diameter and consisting of about 15 facets; antennae 12-segmented, with the three-segmented club twice the length of the remainder of the funiculus. Thorax in profile with high, convex promesonotum descending angularly through the meso-epinotal impression to the epinotal spines, the latter being broadly triangular. Petiole in profile pedunculate, with rounded node which is about one and one-half times the height of the post-petiole. Petiolar node from above transversely elliptical and one and one-half times broader than long. Postpetiole of similar proportions and slightly broader than the petiole. Gaster narrower than the head.

Matte; head above longitudinally vermiculate towards the anterior half, becoming coarsely reticulate posteriorly; thorax and pedicel above coarsely reticulate, each space with a squamate hair, gaster granulose. Pilosity of abundant squamate hairs of somewhat pyriform shape.

Dark brown, appendages distally paler.

HOLOTYPE: One worker (no. 2124.1) taken 17 miles north of Beni, Belgian Congo, February 24, 1948. The ant was among humus and leaves under dense rain forest.

Near *C. nummulitica* and *piripilis* of Santschi, the former described from Cameroon, the latter from Belgian Congo. Both are dark, coarsely reticulate ants. *C. nummulitica* is much smaller (2.6–2.7 mm.), and both differ in the proportions of the nodes of the pedicel. The present species has a markedly broad head, broader than the gaster.

### CYPHOÏDRIS,<sup>1</sup> NEW GENUS

Small ants characterized by a broad, shallow but complete antennal scrobe and by a high, rounded promesonotum.

Antennae of worker 11-segmented, with three-segmented club; mandibles triangular and denticulate; frontal lobes feebly developed; scrobe shallow but complete and extending nearly to the occiput; anterior clypeal margin sinuate; eyes moderate in size. Thorax with high, rounded promesonotum sloping evenly to the epinotum, meso-epinotal suture feebly or not marked; epinotal spines; petiole pedunculate with rounded node; postpetiole convex; gaster short, ovate; legs long and slender. Sculpture coarse and pilosity of long, curved hairs.

GENOTYPE: *Cyphoidris spinosus*, new genus and species.

### *Cyphoidris spinosus*, new species

Figures 7, 8

WORKER: Length extended, 4 mm.; of thorax, 1.05 mm. Head in front view, excluding mandibles, 0.91 mm. long by 0.85 mm. wide posterior to eyes, occipital margin broadly impressed, corners rounded, sides broadly convex, anterior clypeal margin produced as a truncate lobe; clypeus raised medially as a lobe, with two feeble carinae running longitudinally, sides in front of antennal insertions flat; frontal lobes feeble, slightly convex and raised; antennal scrobes complete, broad, shallow, and flat, eyes convex, 0.16 mm. in diameter when viewed anteriorly, situated approximately their diameter from the antennal insertions; mandibles triangular, with 10 to 12 denticles along the elongate cutting margin; antennae 11-segmented, with three-segmented club, scape long, slender, slightly bowed and equal in length to the first eight funicular segments and half

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<sup>1</sup> *Cyphoidris*, from the Greek *κυφός*, hump-backed, and *ἰδρίς*, the knowing one or provident one, in allusion to the hump-backed general habitus.

of the ninth taken together, club longer than the remainder of the funiculus. Thorax in side view with high, convex promesonotum sloping evenly to the epinotum and without a meso-epinotal suture, humeri rounded, epinotal spines 0.22 mm. long, narrow and acute, episternal angles in the form of triangular teeth; thorax from above 0.59 mm. broad through the pronotum compared with a breadth of 0.45 mm. through the epinotal spiracles, the meso-epinotal area slightly impressed, epinotal and episternal spines divergent. Petiole pedunculate, with node evenly convex above and ventral surface feebly sinuate; postpetiole in side view slightly higher than the petiole, convex above, and with a feeble tooth anteroventrally; from above the petiolar node appears marginate anteriorly and is four-fifths as broad as the postpetiole. Gaster short, ovate. Legs moderately long and slender, middle and hind tibiae without spines, first tarsal segment about one-third longer than the remainder taken together.

Lucid, coarsely sculptured on trunk except gaster; head in front longitudinally rugulose, with fine punctations, sides vermiculate-punctate; thorax, epinotum, and dorsum of petiole vermiculate-punctate, with a tendency to reticulations; postpetiole much more finely sculptured and gaster and legs glabrous. Pilosity of long, curved hairs most abundant posteriorly; pubescence sparse or absent.

Piceous, with appendages and apex of gaster dark brown.

HOLOTYPE: One worker (no. 2129.2) taken February 25, 1948, 15 miles north of Beni in the Ituri Forest of Belgian Congo. The ant was among leaves and humus of the rain-forest floor.

#### OCYMYRMEX EMERY

*Ocymyrmex* EMERY, 1886, Bull. Soc. Ent. Italiana, vol. 18, p. 364.

A genus of long, spindly ants adapted to life in arid or semi-arid regions. The ants have a moderately large head broader than the narrow thorax and an attenuated petiole with rounded node. The gaster is pear shaped, and the legs are unusually long and slender. Long hairs extend from the clypeus over the mandibles. Similar long, curved hairs extend over the mouth parts from the gular region, in the form of a curved basket, as a psammophore, reducing evaporation from the mouth parts and perhaps keeping out sand. The ants move with great rapidity over the hot soil.

**Ocymyrmex weitzackeri** Emery

Figure 16

*Ocymyrmex weitzackeri* EMERY, 1892, Ann. Mus. Civ. Genova, vol. 32, p. 116, worker.

Described from Basutoland, this species has since been recorded from Cape Province to Tanganyika. The workers have the head as broad or broader than long, the specimens below having the head broader than long.

KENYA: Kibweza, January 15, and about 29 miles south-westerly from Mtito Andei, January 16, 1948. A worker at Kibweza was running rapidly over the hot, dry loam of the village in the fierce sun of mid-afternoon. There was no opportunity for detailed study here or at the second locality which has an area of rocky lava outcrops in grass-woodland.

**Ocymyrmex weitzackeri** subspecies **celer** Weber

*Ocymyrmex weitzackeri* subsp. *celer* WEBER, 1943, Bull. Mus. Comp. Zool. Harvard Coll., vol. 93, p. 368, worker.

The subspecies was described from the dry plains north of the Imatong Mountains which lie within the Anglo-Egyptian Sudan frontier with Uganda. It has the worker head longer than broad and the petiole less strongly sculptured. Workers taken at Juba in the Sudan March 20, 1948, agree well with cotypes and differ from the above Kenya specimens in the characters of the subspecies. The ants were taken at the height of the dry season close to the White Nile River. The ants were running fast and erratically over sand which had a temperature of 53° C., the maximum range of my thermometer, or possibly higher.

**RHOPTROMYRMEX** MAYR

*Rhoptromyrmex* MAYR, 1901, Ann. Naturhist. Hofmus., Vienna, vol. 16, p. 18, worker.

A genus of small ants allied to *Tetramorium*, with 12-segmented antennae, three-segmented club, head somewhat cordate, frontal carinae short, frontal scrobes lacking, thorax short and stout, convex above, epinotum unarmed, and pedunculate petiole.

### **Rhoptromyrmex opacus** Forel

*Rhoptromyrmex opacus* FOREL, 1909, Ann. Soc. Ent. Belgique, vol. 51, p. 59, worker.

Uganda, 7 miles east of Fort Portal, February 19, 1948, approximately 5000 feet elevation, from leaf humus cover under heavy gallery rain forest.

### **DECAMORIUM** FOREL

*Tetramorium* subgenus *Decamorium* FOREL, 1913, Ann. Soc. Ent. Belgique, vol. 57, p. 121, worker.

Closely related to *Tetramorium* and differing chiefly in having 10-segmented antennae, clypeus broad and flat, with lateral margins feebly developed, antennal scrobes distinct, and tibiae and femora strongly incrassate.

### **Decamorium decem** (Forel)

*Tetramorium* (*Decamorium*) *decem* FOREL, 1913, Ann. Soc. Ent. Belgique, vol. 57, p. 121, worker.

Described originally from specimens sent to Forel from Rhodesia by Arnold; the latter has since recorded it from a number of Southern Rhodesia localities. According to him there is considerable variation in color within the species. It is a small, shiny species, usually dark ferruginous to brown in color, with a glassy dark brown gaster. The specimens below are darker than some Rhodesian workers and are slightly variable in sculpture and proportions of the pedicel.

Kenya, latitude 1° 38' S., longitude 35° 17' E., February 6, 1948. A worker was taken in luxuriant forest of a donga after a heavy but short shower the night before; it was among leaves and humus of the forest floor.

Uganda, Eastern Province, North Lango, about native huts, May, 1938 (J. M. Watson) (Weber coll.). About 40 miles beyond Fort Portal on the way to Katwe, February 22, 1948; several workers suggesting ponerines in their compact habitus and crawling close to the ground of a burned-off grass-woodland.

Belgian Congo, Aba-Juba, Sudan road near frontier, July 19, 1939 (N. A. Weber).

### **MICRODACETON** SANTSCHI

*Microdaceton* SANTSCHI, 1913, Bull. Soc. Ent. France, p. 478, worker.

An obscure, typically dacetine genus with six-segmented antennae, cordate head, linear mandibles, large frontal lobes and no scrobes, and dentate or spinose head, thorax, and petiole.

***Microdaceton tibialis*, new species**

Figure 25

WORKER: Length, 3.1 mm.; of head, 1.5 mm.; of thorax, including neck, 1.8 mm. Head in front view cordate, the occipital region strongly excised, its median portion truncate and receiving the pronotum, its corners biconvex, forming an acute angle, and feebly though distinctly tuberculate in front; sides convex from behind to the eyes, feebly tuberculate posteriorly, straight and converging in front of eyes, anterior clypeal margin truncate, emarginate medially, anterolateral corners rounded; eyes visible from in front, situated closer to the anterior clypeal margin than to the occipital angles, impressed in sockets at the sides of the head, moderately convex; mandibles long and subparallel, less than half the total length of the head with mandibles, devoid of teeth to the apex which is equipped with three spiniform teeth, the median being slightly longest; antennae long and slender, six-segmented, the scape slightly enlarged and bent distally, terminal funicular segment almost as long as the preceding three taken together. Thorax in side view with feebly convex pronotum, a strong, acute, and pointed tubercle on each side just in front of the meso-epinotal impression, the latter being strong; basal surface of the epinotum plane, declivous surface feebly concave, the spines straight, long, acutely pointed, and directed backward and above; episternal or inferior epinotal angles long and acutely pointed; thorax from above convex through the pronotum which is the broadest part of the thorax, impressed in the meso-epinotal region. Petiole with long peduncle rising smoothly to a node which bears anteriorly a pair of acute tubercles and posteriorly a single median tubercle projecting over the postpetiolar impression, the petiole gradually thickening from before backward. Postpetiole deeply emarginate medially in front, slightly over twice as broad as the petiole and slightly over twice as broad as long, projecting laterally as a wing on each side which has a sinuate margin convex anteriorly, acutely pointed behind, posterior margin convex and bearing a pair of medial gibbosities,



postpetiole in side view slightly over half as high as the petiolar node. Gaster ovate, anterior margin truncate, anterior angles evenly convex. Legs long and slender, the first tarsal segment longer than the following segments taken together.

Shining; head and thorax evenly and densely punctate, thorax and pedicel also feebly and shallowly rugose, gaster smooth. Pilosity of a sparse pubescence nearly absent from the body, and on the gaster in the form of minute, yellowish, appressed hairs; appendages with a sparse, yellowish pubescence. From the mouth parts project a few long hairs, of which the median one projects through the space between the mandibles over two-thirds the way to the apex.

Body dark brown, the gaster blackish brown; appendages much paler, being a light brown except on the femora and tibiae which are ivory colored.

HOLOTYPE: One worker taken March 15, 1948, north of Stanleyville, Belgian Congo, in latitude  $0^{\circ} 45' N.$ , longitude  $25^{\circ} 15' E.$  The ant was in thick, wet leaf cover at the base of a large tree in dense rain forest.

This is a striking species in both body form and color. The thorax dovetails into the strongly emarginate head, and the slender pedicel is protected by strong epinotal spines in front and by the unusual unpaired petiolar tooth behind. The long, porrect mandibles open laterally as do those of the common tropical ponerine, *Odontomachus*, and the ant probably seeks its prey similarly with the large mandibles widespread and equipped at the apex with three long, spiniform teeth. The single long hair projecting into this space from the mouth parts doubtless acts as a trigger. When it comes into contact with the prey, which may be small insects like Collembola, sensory cells at the base are probably stimulated to cause adductor muscles operating the mandibles to close sharply and seize the prey.

Nearly to the present date *Microdaceton* has been considered to be monotypic since its description in 1913, with *exornatum* Santschi, from Zululand, being the type species. In November, 1947, Patrizi described a second species, *leakeyi*, from Olorgasalic (Masai Reserve) in Kenya, based on a female.

The present species differs markedly from these. It is much smoother than *exornatum* and darker on the body though lighter on the appendages. It differs from both in having a

postpetiole about two times wider than the petiole or than its own length rather than three times in these proportions. The female of *leakeyi* has a gaster basally striate and appears to lack the median petiolar tubercle.

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